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EXAMINER
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2189	

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Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/811,290	TAKIZAWA, TETSURO
	Examiner	Art Unit	
	Daniel B. Ko	2189	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>26 March 2004</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-20</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-20</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>26 March 2004</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>5/5/2004</u>.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail. Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

This action is responsive to the application filed on 3/26/2004. Claims 1-20 have

been submitted for examination.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 5/5/2004 was

considered by the examiner.

Claim Objections

Claims 6-10 and 16-20 are objected to because of the following informalities:

Regarding claims 6-10 and 16-20, lines 3-5, "said memory control unit of

information about said bank and said page to be accessed and wherein said memory

control unit" are not clear.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1.   Claims 1 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by

Sprangle et al. (US Patent 7.020,762 B2), hereinafter simply Sprangle.

        Regarding claims 1 and 11, Sprangle teaches a memory access control device

comprising:

        a memory master to make a request for access to memory (column 2, lines 27-

32);

        a memory control unit to produce control signals of memories based on access

information to be output from said memory master (column 2, lines 50-54; column 4,

lines 18-21); and

        a hit predicting unit (Figure 3, Page Hit Predictor 330, column 4, lines 31-37) to

predict whether or not next access to each bank in memory becomes access to a same

page; wherein said memory control unit, when a hit predicting unit predicts that "a page

hit is found" which means that "next access to said bank becomes access to a same

page", terminates its routine without closing a bank being presently accessed at time of

completion of present access operations and, when said hit predicting unit predicts that

"a miss hit is found" which means that "next access to said bank becomes access to a

different page", closes said bank being presently accessed at time of completion of

present access operations and terminates its routine (column 4, lines 61-67; column 5,

lines 1-13).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

2.   Claims 2-10 and 12-20 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Sprangle et al. (US Patent 7.020,762 B2), hereinafter simply

Sprangle, in view of Sander et al. (US Patent 6,976,122 B1), hereinafter simply Sander.

Regarding claims 2 and 12, Sprangle teaches a memory access control device

comprising:

a memory master to make a request for access to memory (column 2, lines 27-

32);

a memory control unit to produce control signals of memories based on access

information to be output from said memory master (column 2, lines 50-54; column 4,

lines 18-21); and

a hit predicting unit (Figure 3, Page Hit Predictor 330, column 4, lines 31-37) to

predict whether or not next access to each bank in memory becomes access to a same

page; wherein said memory control unit, when a hit predicting unit predicts that "a page

hit is found" which means that "next access to said bank becomes access to a same

page", terminates its routine without closing a bank being presently accessed at time of

completion of present access operations and, when said hit predicting unit predicts that

"a miss hit is found" which means that "next access to said bank becomes access to a

different page", closes said bank being presently accessed at time of completion of

present access operations and terminates its routine (column 4, lines 61-67; column 5,

lines 1-13).

Sprangle fails to teach a memory access control device, wherein said hit

predicting unit stores results from last "n" (n is a natural number) times accesses to

each bank in memory as to whether a page hit has been found or a miss hit has been

found and predicts, if a number of times of accesses by which a page hit is found out of

last "n" times accesses is "m" or more (m <= n: "m" and "n" are natural numbers), that a

page hit is found in next access to said bank, and on the other hand predicts, if said

number of times of accesses is not "m" or more, that a miss hit is found in next access

to said bank. Sander teaches a memory access control device, wherein said hit

predicting unit stores results from last "n" (n is a natural number) times accesses to

each bank in memory as to whether a page hit has been found or a miss hit has been

found and predicts, if a number of times of accesses by which a page hit is found out of

last "n" times accesses is "m" or more (m <= n: "m" and "n" are natural numbers), that a

page hit is found in next access to said bank, and on the other hand predicts, if said

number of times of accesses is not "m" or more, that a miss hit is found in next access

to said bank (column 7, lines 1-19; Sander discloses threshold register which is

equivalent to last "n" times accesses is "m" or more).   At the time of invention, it would

have been obvious to a person of ordinary skill in the art to combine the Sprangle with

Sander. The motivation for doing so would have been an improved paging policy

(column 2, lines 5-9).

Regarding claims 3-4 and 13-14, Sprangle teaches a memory access control

device, wherein said hit predicting unit stores results from last "j" ("j" is a natural

number) times accesses to each bank in memory as to whether a page hit has been

found or a miss hit has been found and predicts, when a page hit has been found in all

last "j" times accesses, that a page hit is found in next access to said bank, and on the

other hand predicts, if no page hit has been found at least one time in all last "j" times

accesses, that a miss hit is found in next access to said bank (column 4, lines 61-67;

column 5, lines 1-13; Assuming "j" is 1, hit predict is based on last accesses to the bank

in memory. Similarly, assuming "k" is 1, miss predict is based on last access to the

bank in memory).

Regarding claims 5 and 15, Sprangle and Sander teaches a memory access control device, wherein said hit predicting unit stores results from last "n" ("n" is a natural number) times accesses to each bank in memory as to whether a page hit has been found or a miss hit has been found and predicts, when a miss hit has been always found in all last "k" times accesses (k <= n: "k" and "n" each are a natural number) out of last "n" times accesses, that a miss hit is found in next access to said bank and predicts, when no miss hit has been found at least one time in all last "k" times accesses out of last "n" times accesses (See Sprangle, column 4, lines 61-67; column 5, lines 1-13; Assuming "k" is 1, miss predict is based on last access to the bank in memory), if a page hit has been always found in all last "j" times accesses (j <= n: "j" and "n" each are a natural number) out of last "n" times accesses, that a page hit is found in next access to said bank and predicts, when a miss hit has been found at least one time in all last "j" times accesses out of last "n" times accesses (See Sprangle, column 4, lines 61-67; column 5, lines 1-13; Assuming "j" is 1, hit predict is based on last accesses to the bank in memory.), if a number of times of accesses by which a page hit has been found out of last "n" times accesses is "m" times or more (m <= n: "m" and "n" each are a natural number), that a page hit is found in next access to said bank and predicts, when a number of times of accesses by which a page hit has been found out of last "n" times accesses is not "m" times or more, that a miss hit is found in next access to said bank (See Sander, column 7, lines 1-19; Sander discloses threshold register which is equivalent to last "n" times accesses is "m" or more).

Regarding claims 6-10 and 16-20, Sander teaches a memory access control device, wherein said memory master informs, when a bank and a page to be accessed next have been determined, said memory control unit of information about said bank and said page to be accessed and wherein said memory control unit, if said bank to be accessed next by said memory master is same as that being presently accessed and said page to be accessed by said memory master is same as that being presently accessed, terminates its routine, regardless of a prediction result from said hit predicting unit, without closing said bank being presently accessed at time of completion of present access operations (column 1, lines 44-51) and, if said bank to be accessed next by said memory master is same as that being presently accessed and said page to be accessed by said memory master is different from that being presently accessed, closes said bank being presently accessed at time of completion of present access operations, regardless of a prediction result from said hit predicting unit, and terminates its routine (column 1, lines 39-43).

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Daniel B. Ko whose telephone number is 571-272-8194.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Reginald G. Bragdon can be reached on 571-272-4204. The fax phone

number for the organization where this application or proceeding is assigned is 703-

273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

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